



**Washington State  
Department of Transportation**

# Measures, Markers and Mileposts

**The Gray Notebook for the quarter ending June 30, 2001**

WSDOT's quarterly report to the  
Washington State Transportation Commission  
on transportation programs and department management

**Douglas B. MacDonald**  
Secretary of Transportation



This periodic report is prepared by WSDOT staff to track a variety of performance and accountability measures for routine review by the Transportation Commission and others. The content and format of this report is expected to develop as time passes. Information is reported on a preliminary basis as appropriate and available for internal management use and is subject to correction and clarification.

# Measures, Markers and Mileposts

The Gray Notebook for the quarter ending June 30, 2001

## Table of Contents

### Worker Safety

- Highway Maintenance Workers ..... 1
- Highway Engineer Workers ..... 1
- Ferry Vessel Workers ..... 1

### Highway Construction Program Delivery

- Highway Construction Projects  
1999-2001 Biennium Results ..... 2

### State-Supported

#### Amtrak Cascades Service ..... 3

#### Commute Trip Reduction ..... 6

#### Highway Traffic Congestion ..... 8

### Pavement Conditions on the State Highway System..... 12

### Highlights of Program Activities

- May 2000 ..... 15
- June 2000 ..... 15

### Special Features

- Lane Miles Added to  
State Highway System ..... 16
- Truck Drivers Provide Feedback  
on Pass Travel Conditions  
and Anti-Icer Use ..... 16

### Comics Section

- Our Quarterly Cartoon ..... 17

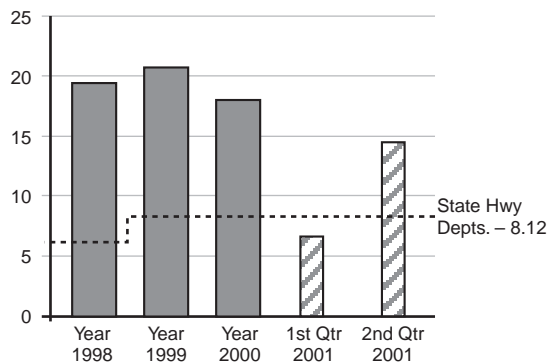
### “What gets measured, gets managed.”

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# Worker Safety

## WSDOT Highway Maintenance Workers

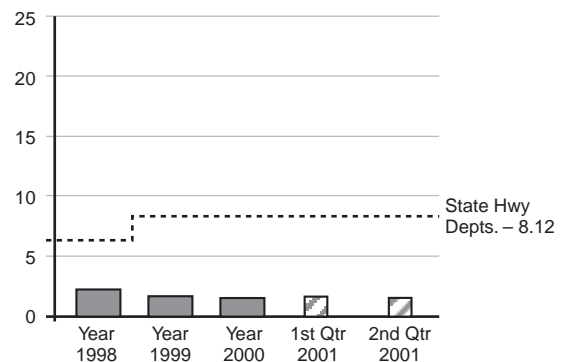
Recordable Injuries per 100 Workers per Year



- There is a significant decrease in recordable injuries for the first two quarters of 2001 compared to 2000. The mid-year 2000 accumulative rate was 15.5; the mid-year 2001 accumulative rate is 9.7.
- *Backs* continue to be the most often injured part of the body for maintenance workers, accounting for 19% of the injuries.
- *Vehicles* are the source of 12% of injuries for 2001. Three cases involved workers being *struck by vehicle*; the majority involved *falling from or stepping off a vehicle*.
- 21% of the injuries and illnesses resulted from not wearing *personal protection equipment or insufficient footwear*.

## WSDOT Highway Engineer Workers

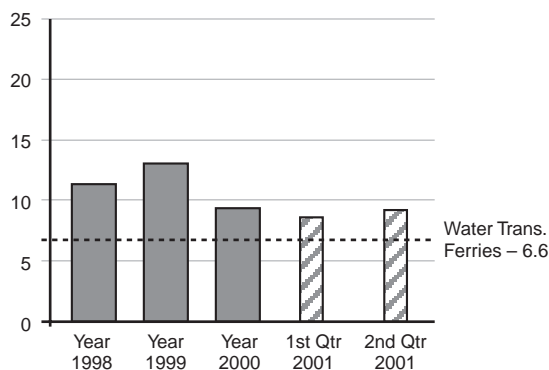
Recordable Injuries per 100 Workers per Year



- The 2001 accumulative rate to date is slightly higher than the 2000 annual rate but remains well below benchmarks of state highway departments. A search for a better benchmark is being conducted.
- *Sprains* (47%) were the most frequent type of injury for engineer workers.
- *Backs* (26%), *ears* (20%) and *legs* (20%) were the most injured parts of body.
- 20% of the injuries and illnesses resulted in not wearing *personal protection equipment or insufficient footwear*.

## WSDOT Ferry Vessel Workers

Recordable Injuries per 100 Workers per Year



- *Sprains and strains* remains the leading type of injury for WSF vessel workers. In the 2nd quarter they accounted for 32% of the injuries. This is down from 2000 and 1st quarter of 2001.
- The *back* and *extremities* are the most common part of the body injured. *Backs* accounted for 68% of the injuries in the first quarter; down slightly in the second quarter.
- The percent of *back* injuries is higher for WSF vessel workers than the percent for highway maintenance workers.
- *Sewage spills* caused by ruptured hoses and disconnected couplings accounted for 19% of the injuries. This required post exposure medical treatment immunoglobulin shots.

## Reading the Charts

"Recordable injuries and illnesses" is a standard measure that includes all work related deaths and work-related illnesses and injuries which result in loss of consciousness, restriction of work or motion, transfer to another job, or require medical treatment beyond first aid.

The selected national average benchmarks are adapted from National Safety Council computations made after-the-fact for each year (most recently 1999) from data published by the U.S. Bureau of Labor Statistics.

The maintenance and engineering charts benchmark against a classification for State Highway departments.

The ferry vessel worker chart benchmarks against a classification for Water Transportation, Ferries.

One worker equals 2,000 hours per year.

## What's to come:

- More information on injury trends and safety programs.
- More information on accident costs and how they can best be reduced and managed.

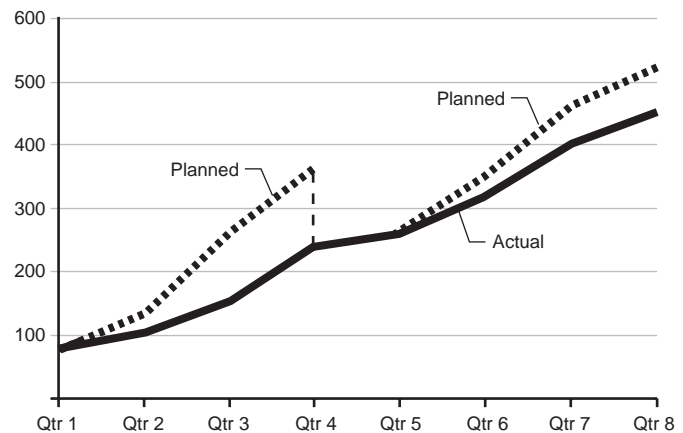
# Highway Construction Program Delivery

This graph shows WSDOT's progress in meeting scheduled highway construction project bid advertisement dates for the quarter ending June 30, 2001. This updates the graph shown last quarter (Quarter 8 of the 1999-2001 biennium).

While the results show some improvement from Quarter 7 to Quarter 8, it is clear that this performance measure needs to be used with great care. Further analysis prompted by the Quarter 7 Gray Notebook has suggested that recurring issues causing project slippage include:

- Projecting insufficient time for design work.
- Delayed scoping and preliminary engineering of projects allowing insufficient time for coordination with stakeholders in permitting approval and design coordination (for example, even "safety" projects of relatively modest scope require review of conceptual solutions with environmental and local government partners; significant delays can be encountered in establishing requisite mitigation for concerns expressed late in the preliminary engineering process).
- Some projects have also been delayed because roadway preservation measurement cycles and supporting data collection have not supported schedules to get "projects to advertisement."

**Statistics on Actual vs. Plan in Advertising Highway Construction Projects for 1999-2001 Biennium, Quarter 8 Ending June 30, 2001**



The delivery gap at the end of Quarter 8 was 47 net projects. This reflected 83 projects deferred and 36 projects advanced. This can be compared to the delivery gap at the end of Quarter 7 which was 61 net projects with 95 projects deferred and 34 projects advanced. The "catch-up" from Quarter 7 to Quarter 8, while small, is encouraging.

These issues are receiving closer attention from program management and engineering staff as a result of the Gray Notebook measurement process.

## New Program Delivery Measures to Come: The Rest of the Story

Tracking "projects to advertisement" is a good management tool but it does not communicate the **impact** of the missed advertisement dates. To better understand this impact, the following questions need to be answered:

- Did the delayed advertisement result in a lost construction season?
- Did the delayed advertisement also cause a delay in the projected "open to traffic" date?

Program Management is in the process of developing additional measures to be used to report this information in the next biennium. In addition, we are also seeking to present these measures in greater detail to look at specific subprograms (mobility, safety, roadway and bridge preservation, etc.).

# State-Supported Amtrak Cascades Service

WSDOT supports the development of Amtrak Cascades intercity passenger rail service. This service provides travelers with an option to automobile transportation on the Interstate 5 corridor.

WSDOT's goal is to increase ridership, reduce travel times, and increase the number of trains operating between Seattle and Portland and Seattle and Vancouver, BC. These goals will be realized through the completion of a sequence of capital projects along the Pacific Northwest Rail Corridor, the purchase of new train equipment, and aggressive marketing.



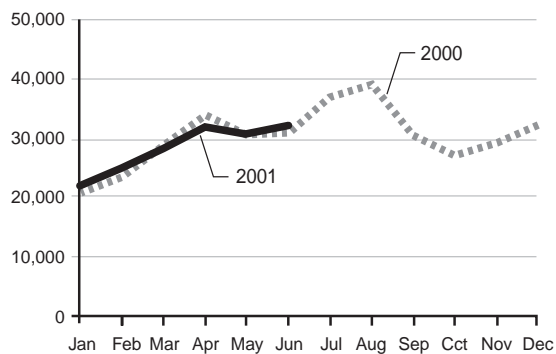
The following performance indicators relate principally to the eight Washington state-supported Amtrak trains. Three other trains providing service between Seattle, Portland, and Eugene are supported by Amtrak and the Oregon Department of Transportation, and are included in this data only where specifically noted.

## Ridership

The calendar year 2001 ridership goal for state-supported Amtrak service is 385,000, which is a 5 percent increase vs. 2000.

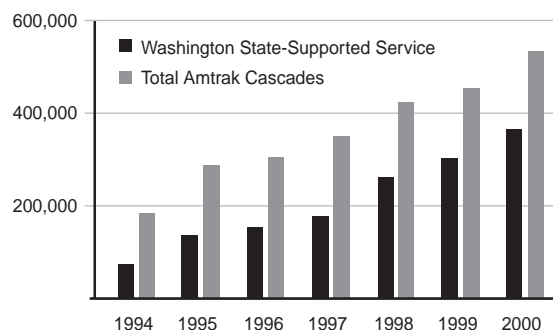
### Monthly Ridership: 2001 vs. 2000

Washington State-Supported Amtrak Cascades Service



For the first six months of 2001, ridership is about equal to the first six months of 2000. Seat reductions on the service – as the Talgo fleet was modified to comply with a recent Federal Railroad Administration ruling – are believed to have held back ridership growth. These cars are now back in operation and ridership gains vs. 2000 are expected through the summer and fall of 2001.

### Long-Term Trends in Amtrak Cascades Annual Ridership



The average annual rate of ridership growth on the state-sponsored trains has been approximately 20% per year since 1994. The program plans to add an additional round trip between Seattle and Portland by 2004. WSDOT hopes that capital improvements to be made in British Columbia will allow both trains north of Seattle to operate to Vancouver. WSDOT believes these developments would support substantial ridership increases.

Total Amtrak Cascades ridership, which includes trains 552, 750, and 755 (supported not by WSDOT, but by Amtrak and the Oregon Department of Transportation), has nearly tripled since 1994.

## Train Occupancy

WSDOT is working to develop a meaningful measure for train occupancy. *Load factor*, which is a common measure of occupancy in many segments of the transportation industry, has significant limitations in the circumstance of intercity rail service. A performance indicator for train occupancy that is better suited for the Amtrak Cascades is expected to be in the next quarterly report.

### On-Time Performance

A train arriving at its final destination no later than 10 minutes behind its scheduled arrival is deemed "on-time." WSDOT and Amtrak have set an on-time performance target of 80 percent. The on-time performance for June 2001 was 82 percent. This is an improvement when compared to the 73 percent on-time performance for the same period in 2000.

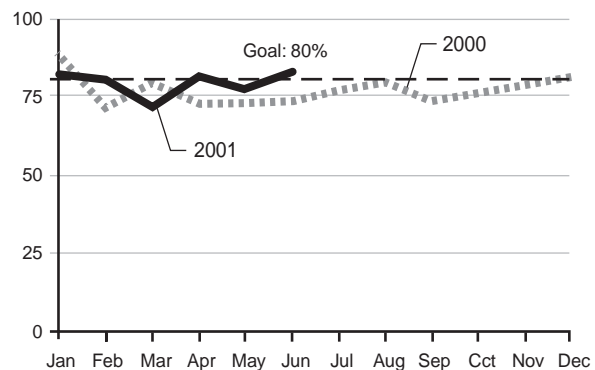
The improvement to date in 2001 vs. 2000 is largely attributable to an adjusted schedule for train 750 out of Eugene, OR, that minimizes freight interference, and fewer freight-induced delays within the corridor.

Additional steps to improve on-time performance of the service include:

- Capital improvements to the rail corridor that will increase rail capacity and reliability, and;
- Negotiations with Amtrak and the Burlington Northern/Sante Fe Railroad (BNSF) to reconcile WSDOT on-time performance standards with those included in the BNSF/Amtrak national operating contract.

### On-Time Performance

First Six Months of 2001 vs. 2000



## Customer Satisfaction Index

Amtrak regularly surveys its passengers to gauge customer satisfaction on all trains it operates in the United States. The Amtrak Cascades are consistently rated at the very top in overall customer satisfaction each year. The Amtrak survey also captures data on specific components of the service, including food quality, cleanliness of the train, and on-board staff performance. This data quickly directs WSDOT's attention to real and potential problem areas. The results, as summarized by Amtrak's most recent survey from April 2001, are:

- The performance target for customer satisfaction is 92 or higher. The most recent three month rolling average score for the Cascades North was 94, compared to 95 last year. One of the reasons for this lower score stems from customer concerns regarding the helpfulness of the train crew.
- The score for the Cascades South (including trains 552, 750 and 755) was 93, compared to 92 last year. Though this represents an increase over 2000, some passengers expressed concerns about on-board crew performance.

WSDOT staff will be following-up with Amtrak on the areas noted in the survey where attention seems to be required.

## Congestion Relief and Improved Mobility Options Along the I-5 Corridor

Amtrak Cascades service parallels the heavily-congested I-5 highway corridor. It has two important functions:

First, to the extent the service carries passengers who otherwise would make their trip by car (about 59% of the passengers, based on WSDOT's survey data), the service provides a small measure of congestion relief. WSDOT staff use a formula (see box at right) to suggest the scale of this relief has grown by the year 2000 to about 143,000 vehicle trips annually.

Second, for the *other* passengers – 41% of the people on the train judging from WSDOT's survey – who would *not* have made the trip by car, the Amtrak Cascade service creates a very attractive mobility enhancement that might otherwise have been completely unavailable.

### Capital Improvement Program and WSDOT Service Goals

The ultimate goals of the program are:

- 13 daily round trips between Seattle and Portland, with a one-way running time of 2 hours and 30 minutes; and
- Three to four daily round trips between Seattle and Vancouver, BC, with a one-way running time of 2 hours and 57 minutes.

Capital projects included in the 2001-2003 budget for environmental review and preliminary engineering in Southwest Washington will provide the necessary capacity to add more service and support travel time reductions of 15 minutes between Seattle and Portland. These projects are:

- Vancouver Rail Yard EIS and preliminary engineering;
- Kelso-Martin's Bluff EIS; and
- Tacoma's Point Defiance Bypass EIS development.

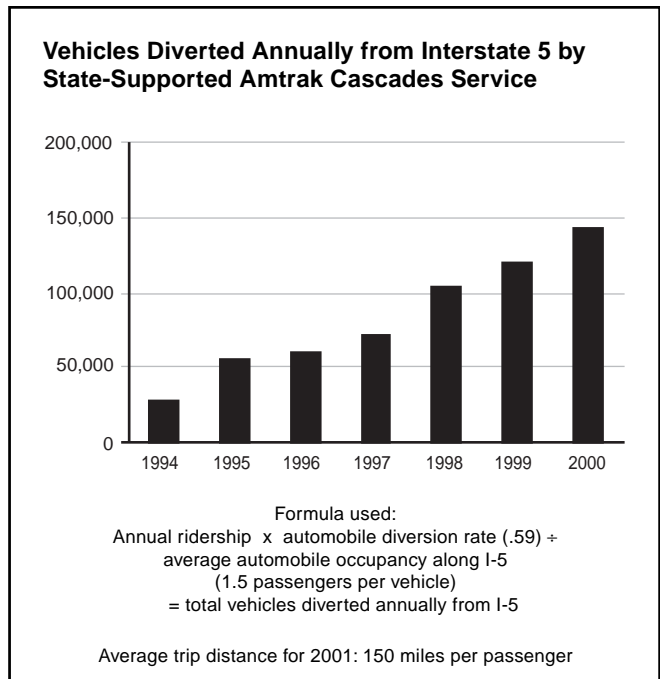
The Gray Notebook will report during the biennium on their timely delivery.

The 2001-2003 budget also contains funding for the following track and grade crossing work on the corridor that support travel time reductions and additional mainline capacity:

- Tacoma's Ruston Way crossover;
- Median separators within the corridor, including Woodland and Thurston County; and
- Steilacoom crossing improvements.

Track and signal work between Seattle and Tacoma funded by Sound Transit will also add mainline capacity and support travel time reductions for the Amtrak Cascades.

**October Gray Notebook:** Total vehicle miles traveled (VMT) offset by state-supported Amtrak Cascades service will be compared to total VMT on the I-5 corridor.



# Commute Trip Reduction

Washington law requires employers located in nine Washington counties who have more than 100 employees to participate in a program to decrease energy consumption, improve air quality and reduce traffic congestion by reducing commute vehicle trips.

WSDOT supports this program with direct and indirect assistance to the employers, and also encourages other employers to voluntarily participate in the program. A tax credit was available in the years 1994-1999 which acted as an incentive for non-obligatory participation. Many employers involved in the program report economic benefits from the program, for example, savings in reduced costs for provision of parking for single-occupancy vehicle commuters.

## Employer Participation

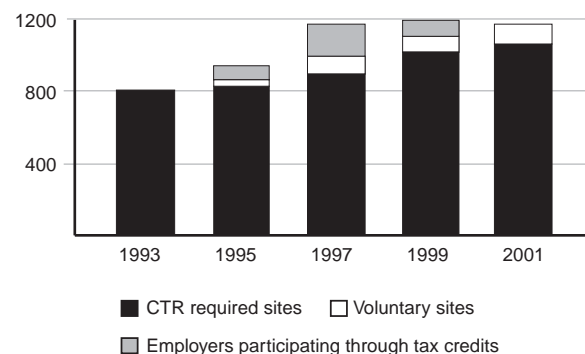
The graph at right shows steady growth since 1993 in the sites participating in the program under the statute (black portion of the bar). Voluntary participation expanded significantly in the years 1995-1997 but remained relatively constant in the recent years. In 2001, participation numbers are reduced in large part as a result of eliminating the Commute Trip Reduction (CTR) tax credit. Restoration of the tax credit has been proposed to encourage additional voluntary program participation.

## Employer Investments

WSDOT has tracked the spending of CTR participant firms in support of the program, as shown in the graph at right. The gray portion of the graph shows direct program investment for everything from bike racks to internal marketing. The black portion of the graph is the value of commuting incentives paid directly to participating employees.



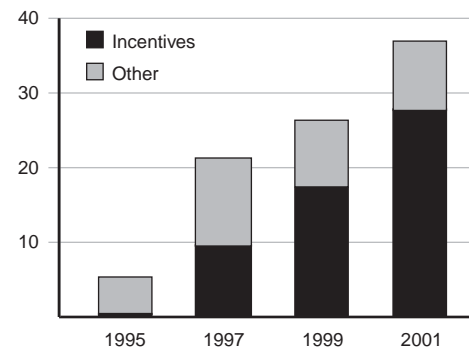
**Participating Employer Sites:  
Early Growth, Flat Trend**



Voluntary sites are those that participate without being required to by statute. Tax credit sites are not required to participate but provide employee incentives and receive the tax credit.

**CTR Encourages Private Investment  
in Commute Choices**

(\$ millions)



## Employer Benefits

Many employers support CTR because of ancillary benefits they derive from their employees' reduction of commuting impacts. For example:

- *ConneXt* in Seattle has reduced their office space needs by 20% (equivalent to one floor of the Rainier Tower) through a telework program.
- The *University of Washington*, through its CTR program, has reduced the need for 3,600 parking spaces. They value this savings at more than \$108 million.
- *CH<sub>2</sub>M Hill* in Bellevue saved \$73,000 through its parking management program and is able to use its CTR program to attract and retain valuable employees.

## Vanpooling Trends

Washington State has been a national leader in the development and growth of vanpooling. Of all vanpools operating in the Puget Sound area, 93 percent travel to CTR work sites.

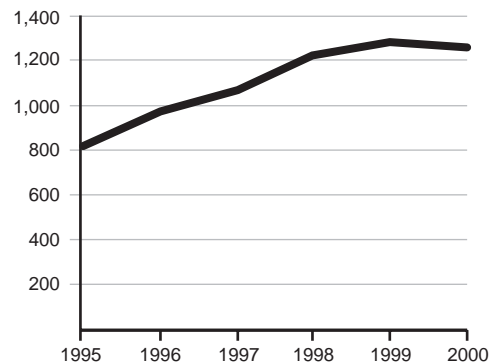
- WSDOT has supported growth in vanpooling since the early 1980s through a van rental and lease program to augment transit fleets. WSDOT currently owns 40 rental vans.
- WSDOT continues to support vanpooling through marketing support, facilitating improvements of the system by bringing employers and operators together, and by encouraging expansion through market analysis.
- In addition to the public vanpool system, the state supports private vanpooling through rideshare tax exemptions. In 1999, an estimated 200 private vanpools were operating in the Puget Sound region.
- Motor Vehicle Excise Tax (MVET) funding lost by the transit systems resulted in fewer vans on the road in 2000. For example, vans operated by Kitsap Transit between 1999 and 2000 were reduced by 62 percent, from 99 vans to 38.

**October Gray Notebook:** A report of numbers of vanpools operating in the Puget Sound region by month.

Moving people in vans reduces the number of drive alone vehicles on the road. Since most vans operate during peak periods, vanpooling's impact in reducing drive-alone Vehicle Miles Traveled (VMT) is particularly important.

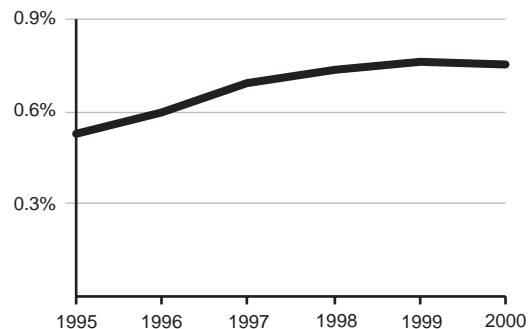
Since 1995, the number of vanpools on the road in the Puget Sound area has increased by 45 percent. However, with the repeal of the MVET, the number of operating vans in the Puget Sound area decreased slightly between 1999 and 2000.

**The trend for public vans in the Puget Sound area was growing, but is now flattening out**



The lost MVET funding impacts in 2000 are also seen in the graph below as VMT vanpool share dropped slightly.

**Vanpooling provides a small but significant share of the daily Puget Sound area VMT**



This performance measure monitors the share of daily vehicle miles traveled in the Puget Sound area by vanpool passengers.

Formula used: *daily vanpool passenger miles ÷ total daily vehicle miles.*

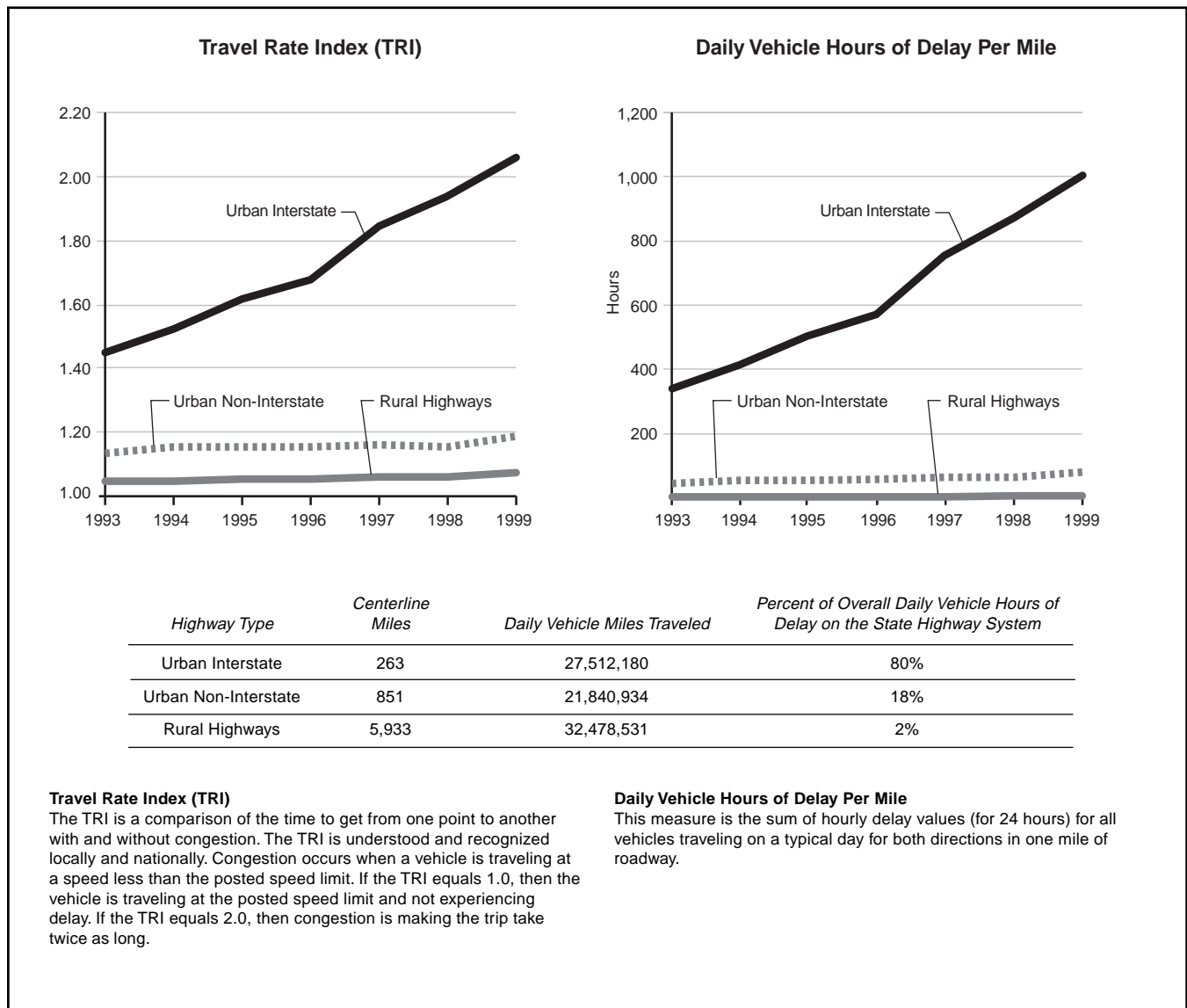
In 1998, van passenger miles represented nearly 2 percent of AM peak VMT.

# Highway Traffic Congestion

This section identifies the location of the traffic congestion problems on Washington State's highway system, defines performance measurements, benchmarks the state's congestion against nationally-used indicators, and describes the operational and capital strategies that address congestion issues.

## Congestion Levels and Trends

The following charts show congestion trends between 1993-1999 using two measures ("Travel Rate Index" and "Daily Vehicle Hours of Delay Per Mile") for three highway classifications (urban interstates, urban non-interstate and rural highways). Preliminary data for 2000 is expected to be available in August 2001.

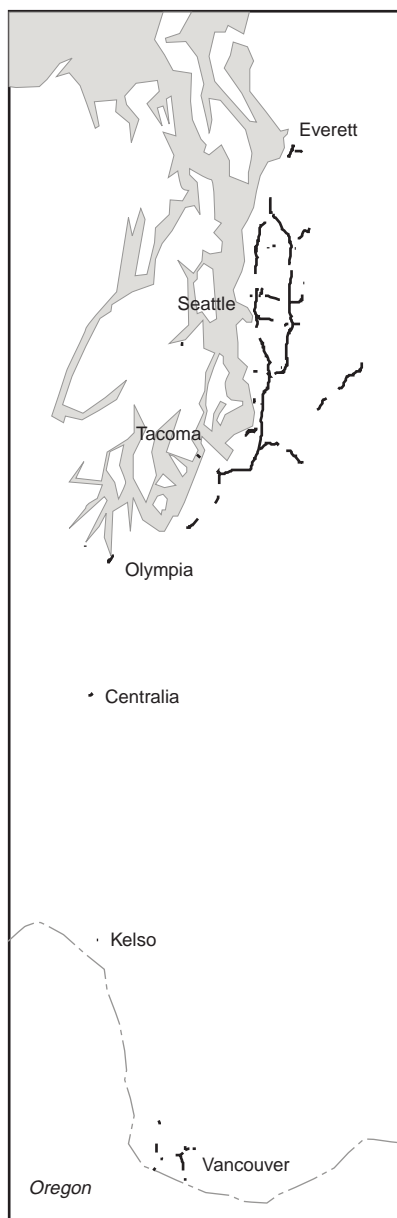


## Washington's Highways That Exceed the National Average for Highway Congestion

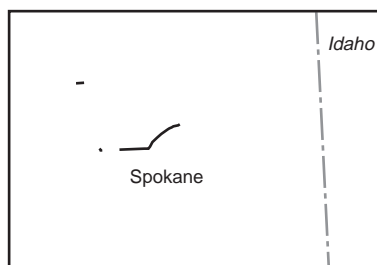
In the effort to identify the highways that are experiencing severe delay, WSDOT used the national average TRI of 1.3 as determined by Texas Transportation Institute. Although the methodologies used by WSDOT and the Texas Transportation Institute cannot be precisely reconciled, the data comparability is sufficient to identify the particular highway segments in Washington State that show congestion generally exceeding the national average. For highways in the state highway system, the locations with severe congestion are as follows: 116 miles of urban interstate; 39 miles of urban non-interstate; and 73 miles of rural highways; a total of 228 miles.

The following maps show state highways with a TRI greater than the national average.

**Interstate 5 Corridor Map**



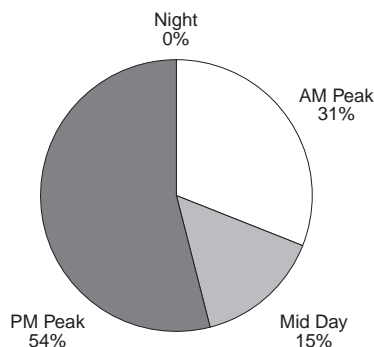
**Spokane Map**



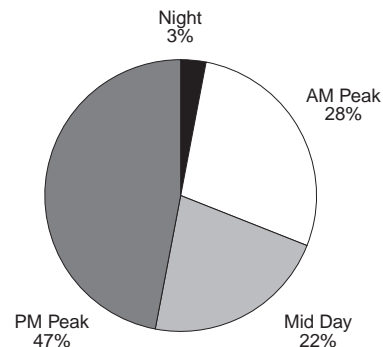
**Popular Commutes Measured by Delay**

<i>Route</i>	<i>Centerline Miles</i>	<i>Travel Rate Index</i>	<i>Daily Vehicle Hours of Delay Per Mile</i>	<i>Daily Vehicle Miles Traveled</i>
I-5 Seattle to Everett	30	2.5	2,328	5,106,306
I-5 Tacoma to Seattle	30	2.7	3,049	5,784,192
I-5 Olympia to Tacoma	30	1.6	554	3,295,523
I-5 Vancouver to Kelso	39	1.1	31	2,401,288
I-90 Spokane to Idaho	22	1.3	126	1,284,611

**Time of Day Distribution of Delay: Urban Interstate**



**Time of Day Distribution of Delay: Urban Non-Interstate**



## Program Steps Toward Congestion Relief

Congestion relief requires operational efficiencies, construction of physical capacity improvements, and reliance on modal efficiency strategies within heavily congested corridors. Almost all strategies require strong partnering relationships among WSDOT and others.

## Operational Efficiency Program Strategies

### Incident Response

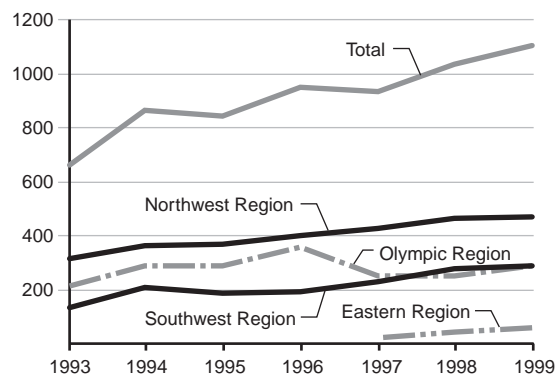
The Travel Time Index, developed by the Texas Transportation Institute, measures the additional time needed to make a trip in the congested time of day. This measure recognizes that delay is based both on traffic demand on the roadways and on the impact of roadway incidents on traffic movement. According to the Institute, in major urban areas, 60% of freeway congestion is the result of incidents that affect the optimal operation of the freeway rather than simply the volume of traffic.

A critical strategy to address congestion is to quickly clear incidents that cause congestion by the use of Incident Response Teams. These teams are specially equipped people and vehicles available at all hours to respond immediately to accidents or other incidents that require on-the-spot traffic control and coordination with Washington State Patrol and other emergency services. Quicker incident response can significantly reduce non-recurring congestion and pay major dividends in time savings for the traveling public.

The measures for incident response are response time and clearance time.

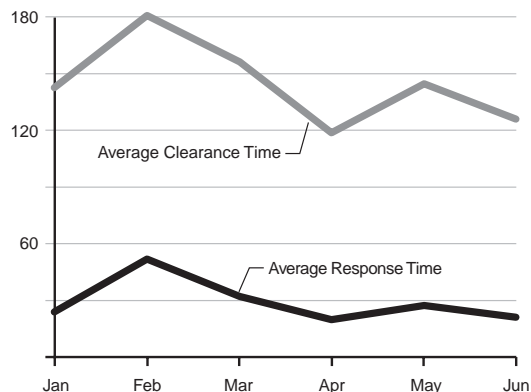
### The Measures for Incident Response

**Growth in WSDOT Incident Response  
Number of Calls Responded To  
(1993-1999)\***



\* Data for 2000 is expected to be available in August 2001.

**Incident Response Time and Clearance Time  
(In minutes, 2001)\***



Average response time is the monthly average time from when an Incident Response Team received a call to when that team arrived on the scene.

Average clearance time is the monthly average time from when the Incident Response Team gets a call to when the incident is cleared from the roadway and all lanes are again free for traffic flow.

\* Benchmark levels have not yet been developed for this critical performance indicator.

### **Ramp Metering**

Ramp metering is used to help merge traffic onto freeways and to manage the flow of traffic through bottlenecks. The traffic is managed to move the maximum flow of vehicles and to make the most efficient use of the freeway. The effects of ramp metering include the increase in freeway volumes and speeds and the reduction of accidents. A performance indicator for the effectiveness of ramp metering has not yet been developed.

### **Traveler Information**

Traveler information consists of roadway condition and congestion information, construction, maintenance and ferry delay information, and emergency and road closure information. Providing the traveling public with this information allows them to make route or timing decisions before or during their trips. A performance indicator for WSDOT's effectiveness in providing traveler information can be developed from logging the public's use of Intelligent Transportation Systems (ITS) programs such as the traffic cameras, traffic speed mapping, and other services available over the Internet and to the local media outlets. Measures in this area will be developed in the next phase of this report.

### **Increasing Lane Use Occupancy**

The transportation system is designed to move both people and goods. While freeway management techniques, like ramp metering and incident response, maximize the number of vehicles carried on a freeway, moving the most people on the transportation system involves moving as many people in each vehicle as well. High Occupancy Vehicle (HOV) lanes are designed as an incentive for use by carpools, vanpools, and transit in order to move the maximum number of people on a system of multiple traffic lanes. WSDOT is a national leader in monitoring, measuring and reporting HOV utilization. Deriving performance measures for the Department's effectiveness for this data is an important task for which the foundation has been laid in reports like *Washington State Freeway HOV Program: Status, Performance, Questions & Answers* (January 2001). Measures in this area will be developed in the next phase of this report.

### **Congestion Pricing**

Congestion pricing is a strategy to spread and manage traffic demand on a highway segment or lane by pricing the use of the facility in recognition of its scarcity value. An example of this would be charging a higher toll on a toll bridge to cross during the congested morning commute and charging less to use the bridge during the middle of the day. Transportation users, observers, policy makers, and operators all across the country are currently exploring the use of congestion pricing as a traffic congestion relief strategy. This can be implemented at a much lower cost than strategies (which may be complementary) for adding peak period physical capacity. WSDOT has not embarked on such programs at this time.

## **Capital Projects Program Strategies**

WSDOT's programs for capital investment in additional physical capacity include the completion of the freeway core HOV lane system in the Puget Sound region, adding or widening highway lanes and connections, and purchasing access rights where use of access significantly adds to congestion by impeding traffic flow. Performance measures on these programs have not yet been developed.

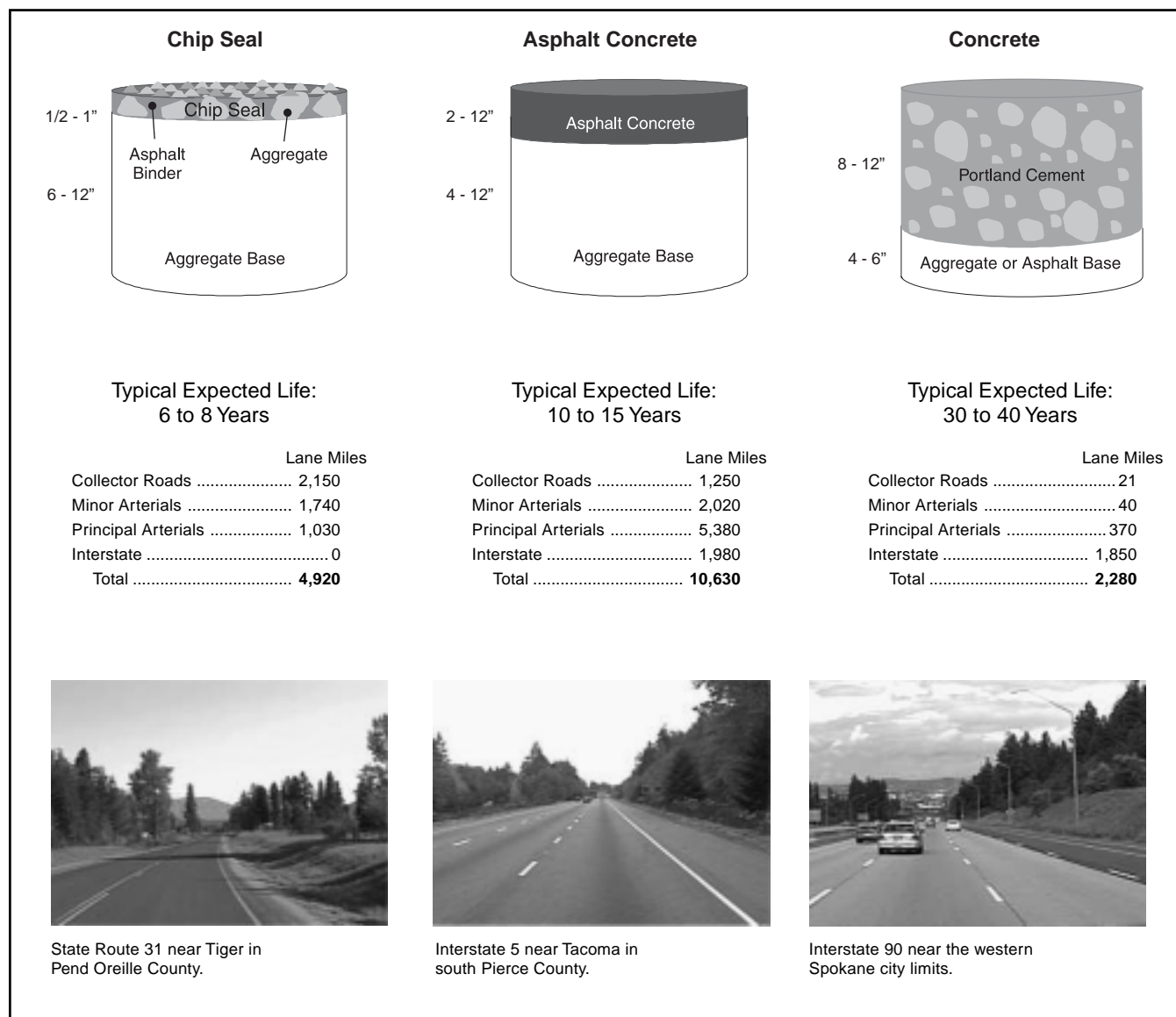
## **Modal Efficiency Strategies**

Performance measures remain to be developed. The information provided on the Commute Trip Reduction program on page 6 is a first step in the direction these measures should take. Many of these strategies are intertwined with the efforts of other agencies (such as transit operators) and local jurisdictions.

# Pavement Conditions on the State Highway System

## What are the different pavement types and how long do they last?

All hard surfaced pavements are either “flexible” or “rigid.” *Flexible* pavements are those surfaced with asphalt materials; these can either be a chip seal or asphalt concrete. A chip seal is used on lower traffic volume roads (generally less than 2,000 vehicles per day) and asphalt concrete is used for higher traffic volume roads. *Rigid* pavements are composed of Portland cement concrete and are generally used for highways carrying the highest traffic volumes.



## What is the strategy for determining when pavements should be rehabilitated to extend their useful life?

WSDOT's desired strategy, endorsed by the Legislature in 1993 – RCW 47.05 “Priority Programming for Highway Development,” is to rehabilitate pavements at the appropriate time to achieve “lowest life cycle cost.” If rehabilitation is done too early, pavement life is wasted. If rehabilitation is done too late, additional costly repair work may be required, or even very costly roadway construction if the underlying surface structure is compromised.

The *lowest life cycle cost* approach requires:

- Appropriate identification of pavement sections that are at the “due” point for rehabilitation every year.
- Project delivery to eliminate the newly-identified “due” pavements and to work down the backlog of “past due” pavements.

## Relationship Between “Poor” Pavement and Rehabilitation Programming

WSDOT's program for determining each year what pavements should be rehabilitated essentially requires the pavement to be placed in the “due” category by catching its normal wear and tear just as its condition moves across the threshold from the bottom of the “good” condition category to the top of “poor” condition category. Under WSDOT's approach, the boundary between “good” and “poor” is triggered on the relevant criteria in any of the three parameters shown in the following box.

### Determining pavements “due” for rehabilitation

#### Pavement Structural Condition (PSC)

A pavement will develop structural deficiencies (for example, cracking) for two reasons, truck traffic and cold weather. The PSC is a measure based on distresses, such as cracking and patching, which are related to the pavements' ability to carry the loads. PSC ranges from 100 (best condition) to 0 (worst condition). A roadway should be rehabilitated when the PSC reaches 50.



#### Rutting

Rutting is caused by heavy truck traffic or studded tire wear. Ruts deeper than 1/2 inch have the potential to hold water, increasing the risk of hydroplaning for high-speed traffic. A roadway should be rehabilitated when the rut depth is greater than 1/3 inch.



#### Roughness

The International Roughness Index (IRI) is a procedure to measure pavement ride. A full sized van, with a laser-measuring device mounted on the front bumper, measures the roughness of the pavement. A roadway should be rehabilitated when the IRI value is greater than 220 inches per mile.



The assessment and rehabilitation activities conducted each year on the roads show an annual single-point-in-time snapshot – including the backlogs of pavements overdue for rehabilitation that were identified but unaddressed from previous years. The commencement of the 2001 rehabilitation season shows a distribution of pavement conditions as follows:

Pavement Type	Percent of Pavements in <b>Good</b> Condition Year 2000	Percent of Pavements in <b>Poor</b> Condition Year 2000	Lowest Life Cycle of Poor Pavement for Rehabilitation Each Year
Chip Seal	87%	13%	14%
Asphalt Concrete	93%	7%	7%
Concrete	90%	10%	3%

At the completion of rehabilitation, the pavements in “good” condition await the coming year’s accumulation of wear and tear. At the same time, pavements in other locations deteriorate into the “poor” designation and await rehabilitation. Of course, the pattern can be altered by actual circumstances that will speed up or slow down the normally expected wear and tear cycle, such as a winter season of unusually severe freeze-thaw activity or dramatic increases in traffic volumes.

WSDOT devotes considerable effort to measuring and assessing pavement condition in the course of managing the pavement rehabilitation program. Changes and improvements in pavement assessment methodology in recent years have meant that meaningful trends from year to year have been difficult to determine. Year to year comparisons are also difficult to establish because annual “snapshots” will be affected by uncontrollable changes in the pavement wear and tear expectation, as described above.

### Performance Indicators

Short-term performance of the pavement rehabilitation program to support the maintenance of appropriate levels of pavement condition can be measured in two ways:

- Is the program of identifying pavements for rehabilitation properly carried out to achieve the goals of the “lowest life cycle cost” approach?
- Are the pavements identified for rehabilitation in fact properly programmed into projects and are the projects delivered and performed?

For the 1999-2001 biennium, 206 projects pavement rehabilitation projects were initially identified and planned. Of those projects that were initially planned along with projects that were later advanced into the program, 198 (96 percent) were taken to advertisement in the biennium period.

Long-term success of the pavement program requires the development of year to year trend data showing how closely the program’s performance comes to achieving the program goals.

# Highlights of Program Activities

## for Quarter Ending June 30, 2001

### May 2001

- WSDOT staff aboard ferries on several routes explaining the June fare increase to ferry customers.
  - Second phase of work begins to repair earthquake damage on SR 99 Alaskan Way Viaduct.
  - Amtrak adds a new stop in Tukwilla.
- 

### June 2001

- I-90 / Hamilton Street off-ramp in Spokane re-opens to traffic.
- Secretary MacDonald and Commissioner Barnes visit Vancouver to meet with federal, state and local officials to identify key transportation issues, priorities, and solutions.
- Groundbreaking on \$38 million SR 18 widening project to improve safety and increase capacity.
- *Sealth* grounding incident off Shaw Island; investigation cites errors by master and quartermaster.
- Cable installation in the median improves safety on I-5 from 54th Avenue East to King County line near Milton and Fife.
- Truckers surveyed on WSDOT winter roadway program for last winter on Snoqualmie Pass (*see report on page 16*).
- SR 271 in Whitman County re-opened after completion of bridge work.
- Southbound Alaskan Way Viaduct to close at night for repairs.
- Groundbreaking for Phase 2 of the \$80 million I-90 Sunset Interchange project in Issaquah.
- Forensic experts assisting with Kingston Dock transfer span failure investigation.
- Speed limits increased on several state highways in Eastern Washington.
- Project begins to install screens to shield motorists from glare of oncoming headlights on I-90 near Snoqualmie Pass.
- Bridge replacement project to start between Cheney and Tyler on SR 904 in Spokane.
- Innovative safety project begins to place rumble strip on centerline on U.S. 395 north of Spokane.
- New Park & Ride designed and built by WSDOT opens in Federal Way.
- “Access Downtown” I-405 SE 8th Interchange project in Bellevue delayed due to an appeal of the Shoreline Substantial Development Permit.
- First construction project on the North Spokane Corridor is advertised.
- Improvements on U.S. Highway 12 in Clarkston have begun.
- I-90 paving and improvement project near Spokane completed nearly seven months early.
- WSDOT surveys Hood Canal Bridge users in preparation of reconstruction planned in 2006.
- Kingston Dock transfer span replacement project to begin in response to the terminal accident in early June.

## Lane Miles Added to State Highway System

WSDOT has added new lane miles to the system as shown below during the period 1996-2001. This information will be posted to the "Frequently Asked Questions" segment of the WSDOT web site.

Region	GP Lanes Miles	GP Centerline Miles	HOV Lane Miles	Interchanges
Eastern	39.50	0.00	0.00	7
North Central	13.39	0.00	0.00	2
Northwest	81.90	0.00	56.83	5
Olympic	33.35	8.45	0.00	10
South Central	14.90	1.00	0.00	3
Southwest	9.00	8.10	0.00	1
Agency Total	192.04	17.55	56.83	28

### Definitions

*GP Lane Miles* ..... General Purpose Lanes include lanes added parallel to existing centerline lanes

*GP Centerline Lanes* .... General Purpose Centerline Lanes include construction of new roadway

*HOV Lane Miles* ..... High Occupancy Vehicle Lane Miles added to system

*Interchanges* ..... New interchanges added to system



## Truck Drivers Provide Feedback on Pass Travel Conditions and Anti-Icer Use

A recent survey of 111 truck drivers sought their perception of WSDOT's performance last winter in maintaining travel conditions on Snoqualmie Pass. In particular, the survey seemed to support the conclusion that the chemical anti-icer program is working, to provide a safer road surface and better travel conditions, but that corrosion problems do present significant concerns.

While we received mixed results on the corrosion question (47 percent noticed corrosion problems; 44 percent did not), the survey also provided feedback on related pass travel conditions. The majority of this customer group was satisfied with pass travel conditions, 72 percent of respondents said they encountered fewer pass closures and delays. During the winter of 1998-1999, Snoqualmie Pass had traction tires advised or required 1,521 hours and chains required 17 hours. The winter of 2000-2001 the same pass had traction tires advised or required 815 hours and chains required 14 hours. Milder weather as well as improved snow/ice control contributed to the improved performance.

Specific feedback on pass travel conditions yielded the following results:

- 72% of respondents said they encountered fewer pass closures and delays.
- 72% said they installed chains less often this winter than in past years.



A WSDOT maintenance truck spraying anti-icer

- 64% said their trip times were reduced this winter.
- 77% spent less time driving on compact ice and snow.
- 79% found the passes to be safer this winter.

The survey on the pass program asked about cleaning the anti-icer from vehicles and whether or not it damages vehicles. We received the following feedback:

- 50% found they had trouble removing anti-icer accumulations from vehicles.
- 47% noticed corrosion problems; 44% did not.
- 63% believed that the benefits of anti-icing outweighed their concerns about the corrosion effects; 25% did not.
- 88% would favor the use of a non-corrosive, non-sticky anti-icer if it were available.\*

*\*Corrosion problems can be reduced by purchasing a more expensive product that is non-corrosive and easier to wash off.*

## Comics Section

